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outline of the morphology, natural history, classification, geographical distribution, and economic uses of the flowering plants and ferns. The second part, to a great extent rewritten, is a dictionary of the classes, cohorts, families, and chief genera, alphabetically arranged. The third part, to which much has been added, is a glossarial index of English names, economic products, technical terms, specific names, etc. Altogether the volume is a most convenient one for any botanist or botanical laboratory.—J. M. C.

Library of John Donnell Smith.—In 1905 JOHN DONNELL SMITH presented to the Smithsonian Institution his herbarium, containing over 100,000 mounted specimens, and his botanical library, containing about 1600 bound volumes. The herbarium has been placed in the U. S. National Museum; but for the present the library is to remain in Baltimore. The collection of books is chiefly taxonomic, and is especially rich in the literature of the floras of Mexico and Central America. This valuable collection has been placed freely at the disposal of botanists, and a very complete and handsome author catalogue has been issued by the Smithsonian Institution as a special publication,[7] in addition to the regular edition (Contrib. Nat. Herb. Vol. XII. part 1). This disposition of his exceedingly valuable herbarium and library emphasizes not only the generosity but also the scientific spirit of the donor.—J. M. C.

Cryptogamic flora of Brandenburg.[8]—The third part of the volume on Algae by LEMMERMANN has just appeared. It is devoted entirely to the Flagellatae, all of the recognized seven "orders" excepting the last (Euglenineae) being presented, and that one is begun.—J. M. C.

NOTES FOR STUDENTS

Paleobotanical notes.—NATHORST has begun the publication of an important series of paleobotanical memoirs.[9] The first deals with Pseudocycas, a new genus from the Cenomanian Cretaceous of Greenland. It has generally been considered that leaves of the Cycadeae made their appearance first in the Triassic, and thus considerably antedated the true Zamieae, which are known earliest from the Tertiary deposits. The author shows that leaves from Cretaceous deposits, which have been described by various authors as belonging to Cycadites or even to the living Cycas, are in reality not to be included in these genera at all, since they differ from the existing Cycas in that each leaf pinnule has a *double* midrib and is attached to the rachis by a broad instead of an attenuated base. On account of these divergences, the author sets up a new genus, Pseudocycas.

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[7] Catalogue of the botanical library of JOHN DONNELL SMITH, presented in 1905 to the Smithsonian Institution. Compiled by ALICE CARY ATWOOD. Special publication, Smithsonian Institution. pp. 94. July 1908.

[8] LEMMERMANN, E., Kryptogamenflora der Mark Brandenburg. Band 3, Heft 3, Algen, 305–496. Leipzig: Gebrüder Borntraeger. 1908.

[9] Kung. Svenska Vetensk. Akad. Handl. **42**:no. 5. 1907; **43**:no. 3. 1908; **43**: no. 6. 1908.

The discovery of the duplicate character of the midrib is due to the microscopic examination of leaf pinnules. Four species are described under the new genus.

The second memoir is on the cuticle of *Dictyozamites Johnstrupi* Nath. By the microscopic study of the cuticle of this species, bleached with *eau de Javelle* and mounted in glycerin jelly, the author shows its close affinity with Otozamites as described by SCHENK.

The third memoir is devoted to the study of a lycopodineous cone from the Rhaetic of Schonen, which the author earlier described, with some reserve, as being of cycadaceous affinities, under the name *Androstrobus Scotti*. A microscopic examination of the cone in question, with the aid of *eau de Javelle* and other bleaching reagents, revealed the fact that it was of lycopodineous affinities, and the name is accordingly changed to *Lycostrobus Scotti*. The cone is attached to an apparently herbaceous peduncle about 2^{cm} in diameter and is about 12^{cm} in length. The minute structure of megasporangia and megasporophylls could not be made out. The megaspores were over 0.5^{mm} in diameter and were characterized by appendages along the triradiate ridges. The rest of the surface was covered with minute spines. The microspores, occurring in distinct clusters, were found in the upper part of the cone, were bifacial as in Isoetes, and were 30 to 50 μ in diameter. The author comes to the conclusion that Lycostrobus is more nearly allied to Isoetes than any living lycopod. This cone is of great interest from two standpoints. It illustrates how extremely unsafe conclusions as to affinities based on mere superficial characters must be, since *as an impression* the fossil was considered as belonging to the Cycadophyta. Also it goes a long way toward demonstrating that Isoetes is a true lycopod, and not an appendage of the fern series, as has been suggested by VINES, FARMER, and CAMPBELL.

The fourth memoir deals with the microscopic investigation of cuticles of fossil leaves, sporangia, spores, etc. Perhaps the most interesting result under this head is the demonstration that ARBER'S *Carpolithus Nathorsti* (1908) is in reality not a seed of a pteridosperm at all, as is supposed by that author, since the supposed seminal organs were shown by maceration to be microsporangia. Numerous abietineous winged pollen grains were found in material from the Trias of Hör. The author comes to the general conclusion: "die Gattung Pinus schon gegen das Ende der Triasperiode, in den nördlicheren Teilen der Erde ausgebildet war." This result appears not to be without significance in connection with present discussions in regard to the antiquity of Pinus. Smaller winged microspores were also found, which the author does not attempt to refer to any existing coniferous genus. It appears not improbable that they represent the microspores of certain of the Brachyphylloideae, a new subtribe of araucarian conifers described by Dr. HOLLICK and the reviewer.

In the fifth memoir the author throws additional light on *Nathorstia* Heer, first described as Daneites from the older Cretaceous of Greenland. By means of maceration he has been able to show that the fossil in question is allied to the living marattiaceous genus Kaulfussia, but differs from it in having the ringlike sorus of sporangia multiseriate instead of simple.

In the sixth memoir *Antholithus Zeilleri* Nath. is discussed, which has been regarded as the staminate inflorescence of Baiera. It is shown that the fossils in question consist of dichotomously divided, dorsiventral organs, the ultimate divisions of which bore eight sporangia. Consequently they do not resemble the staminate flowers of the living Ginkgo.

Throughout the author gives paramount importance to the microscopic examination of his material, and suggests many ingenious and some novel devices for the preparation of the objects for the microscope.—E. C. JEFFREY.

Anatomy of Veronica and Gratiola.—The internal structure of the stem and leaf of about 60 species of Veronica and of *Gratiola officinalis* has been studied by HUCHEDÉ,[10] and his results constitute a very important and interesting contribution to the knowledge of the structure of these genera, especially of the former. The material examined consisted of species from Europe, Asia, Australia, and New Zealand, thus comprising both herbaceous and suffrutescent forms. So far as concerns the leaf and stem, the author has demonstrated that a considerable variation in structure exists in Veronica, in regard to epidermis, chlorenchyma, hairs, endodermis, and pith, and the petiole also offers several good characters for distinguishing a number of species. The species from New Zealand differ in a marked way from the European; for instance in regard to the chlorenchyma, which is mostly composed of palisades, unless it is bifacial; furthermore, by the veins (circular in cross-section) being imbedded in the chlorenchyma and supported by stereome or collenchyma. The stem of the New Zealand species contains but little pericyclic stereome, while the pith is frequently sclerotic. It is quite interesting to see that the author has observed some anatomical characters sufficient for distinguishing *V. virginica* L. from *V. sibirica* L., and *V. saxatilis* Scop. from *V. fruticulosa* L., which by many authors have been regarded as synonyms. Very few species are considered of any importance as medicinal plants, and our *V. virginica* (NUTTALL'S *Leptandra virginica*) is actually the only one which is recognized as such and is still in use (the rhizome).

The paper contains well-written anatomical diagnoses of these species, accompanied by a number of very fine drawings, showing their anatomical characteristics. It is only to be regretted that the root has not been considered, for there is no doubt that the structure of this organ must show variations of no small importance, when we bear in mind that among these species of Veronica are both terrestrial and aquatic types, annual and perennial, herbaceous and suffrutescent. The fact that the primary root persists in some of them, and that it becomes replaced by secondary roots in others, might also deserve notice.

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[10] HUCHEDÉ, J., Veroniques et Gratiole. Etude histologique et pharmacologique. Travaux Lab. Mat. Medic. Ecole Sup. Pharm. Paris 5:137. 1907.